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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/631,609	08/04/2000	Takeo Tanaami	000807	2753

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EXAMINER
FORMAN, BETTY J

ART UNIT	PAPER NUMBER
1634	15

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/631,609	TANAAMI, TAKEO	
	Examiner	Art Unit	
	BJ Forman	1634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 January 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *48-53* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *48-53* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

FINAL ACTION

1. This action is in response to papers filed 6 January 2003 in Paper No. 14 in which claims 42-47 were canceled and claims 48-53 were added. All of the amendments have been thoroughly reviewed and entered. The subject matter of New Claims 48-53 is essentially the same as the subject matter of previous Claims 42-47. The claims differ only in that new Claims 48-53 clarify the language of previous Claims 42-47 so as to overcome the previous rejections under 35 U.S.C. 112. The previous rejections in the Office Action of Paper No. 13 dated 2 December 2002 under 35 U.S.C. 112, second paragraph are withdrawn in view of the amendments. The previous rejections under 35 U.S.C. 103(a) are maintained. All of the arguments have been thoroughly reviewed and are discussed below.

Claims 48-53 are under prosecution.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 48-50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Balch U.S. Patent No. 6,083,763, issued 4 July 2000) in view of Haff et al. (U.S. Patent No. 5,720,923, issued 24 February 1998) and Ohkawa (U.S. Patent No. 5,486,337, issued 23 January 1996).

4. Previous Claims 42, 43 and 46 have been amended and presented as New Claims 48-50. The amendments merely clarify the claim language to overcome the previous rejections under 35 U.S.C. 112, second paragraph. As such, New Claims 48-50 are essentially the same as previously rejected Claims 42, 43 and 46. Therefore, the previous rejections, reiterated below for Applicant's convenience, are maintained.

5. Regarding Claims 48-50, Balch teaches a method for producing biochip comprising the steps of: arranging a plurality of capillaries having bottom open ends disposed at predetermined spacing so that said open ends are adjacent to and above a planar substrate, said open ends having a diameter which prevents biomolecules from dropping down by force of gravity (i.e. the capillaries must be primed to begin printing and therefore, biomolecules are prevented from dropping by force of gravity prior to priming, Column 15, lines 42-44), providing said biomolecules in said plurality of capillaries; applying voltage across said capillaries and substrate during the depositing to allow said biomolecules to move downward by force of attraction through said open ends to deposit said biomolecules onto said substrate at spaced intervals coinciding with said capillary spacing and stopping said voltage during non-depositing condition (i.e. the capillaries and reaction chambers are appropriately modified to maintain and modulate electro osmotic or electrophoretic potential, Column 15, lines 44-52) whereby accurate efficient control of said voltage applying causes uniform and reliable deposits of said biomolecules (Column 12, lines 13-29 and Claim 1) wherein said biomolecules are contained with said capillary and are DNA which is amplified i.e. PCR product is deposited onto the substrate (Column 35, lines 12-19 and Fig. 14) and wherein the biomolecules are deposited by applying a voltage across said capillary array i.e. electro-osmotic and/or electrophoretic force (Column 15, lines 48-50) and wherein the biomolecules are separated from said open ends of said capillaries as extremely marginal droplets and deposited onto said substrate (Column 15, lines 1-3) but they do not teach DNA contained within said capillary array is

amplified within said capillaries by polymerase chain reaction. Haff et al. teach a similar method for producing an array of biomolecules wherein the biomolecules are deposited using a capillary array comprising a plurality of capillaries arranged in the same spacing interval as that of sites on the array and wherein the DNA within the capillary array is amplified within said capillaries by polymerase chain reaction (Column 4, lines 19-35 and Fig. 20) wherein the capillaries pass though "heat exchangers" to provide the required atmospheric temperature changes for the polymerase chain reaction (Column 18, lines 34-44 and Fig. 20 #212 and #213). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the PCR amplification of the DNA in the method of Balch by amplifying the DNA within their capillaries (Claims 31) by changing atmospheric temperature surrounding each capillary (Claim 32) to thereby very rapidly change the temperature of the capillary and PCR reaction within the capillary to greatly reduce the time required for the PCR reaction as taught by Haff et al. (Column 5, lines 27-33) for the obvious benefits of economy time and labor.

Balch teaches the method wherein voltage is applied to deposit drops of picoliter size (Column 14, line 66-Column 15, line 1) from the open ends of the capillary onto the substrate i.e. electro-osmotic or electrophoretic force (Column 15, lines 44-60 and Claims 15, 18 and 19) but Balch and Haff et al do not specifically teach the capillaries are kept apart from the substrate at all times. However, applying voltage across a substrate and capillaries which are kept apart at all times so that they are oppositely charged thereby depositing onto a substrate a droplet of very small volume by force of attraction was well known in the art at the time the claimed invention was made as taught by Ohkawa (Abstract). Specifically, Ohkawa teaches that surface tension holding a droplet in a capillary (Column 3, lines 55-60) is overcome by applying voltage across the substrate and capillary so that the substrate and capillary are oppositely charged thereby allowing a very small volume droplet to move downward by force of attraction and to deposit onto the substrate (Column 7, lines 8-52) wherein the generation of

these electrostatic forces deposit droplet without little if any loss of volume (Column 1, line 63-Column 2, line 1). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to apply the electrostatic deposit of Ohkawa to the electrophoretic/electroosmotic deposit of Balch and to generate an electrostatic force between the capillaries and substrate while keeping them apart to thereby deposit very small volumes of biomolecules without loss of volume as taught by Ohkawa for the obvious benefit of maintaining biomolecule droplet volume (Column 1, line 63-Column 2, line 1).

6. Claims 51-53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Balch U.S. Patent No. 6,083,763, issued 4 July 2000) in view of Haff et al. (U.S. Patent No. 5,720,923, issued 24 February 1998).

7. Previous Claims 44, 45 and 47 have been amended and presented as New Claims 51-53. The amendments merely clarify the claim language to overcome the previous rejections under 35 U.S.C. 112, second paragraph. As such, New Claims 51-53 are essentially the same as previously rejected Claims 44, 45 and 47. Therefore, the previous rejections, reiterated below for Applicant's convenience, are maintained.

8. Regarding Claims 51-53, Balch teaches the apparatus for producing biochips comprising: plurality of capillaries having bottom open ends arranged at a same spacing interval as that of sites on a planar substrate (i.e. capillary sleeve/array template, Column 12, lines 63-67) wherein said open ends have a diameter which prevents biomolecules from dropping down by force of gravity (i.e. the capillaries must be primed to begin printing and

therefore, biomolecules are prevented from dropping by force of gravity prior to priming, Column 15, lines 42-44); means for providing said biomolecules to said plurality of capillaries i.e. pressurized fluid supply chambers (Column 15, lines 38-44); adjusting means for adjusting a gap formed between said capillary holder means and said substrate i.e. print head and positioning device (Column 15, lines 26-37 and Claim 7); transfer means for transferring biomolecules from said capillaries to said substrate and enabling said biomolecules to remain in said plurality of capillaries during non-depositing state (i.e. the capillaries and reaction chambers are appropriates modified to maintain and modulate electro osmotic or electrophoretic potential, Column 15, lines 44-52) whereby accurate efficient control of said voltage applying causes uniform and reliable deposits of said biomolecules (Column 12, lines 13-29 and Claim 1) and voltage means for applying voltage across said capillary holder means e.g. electro-osmotic or electrophoretic force (Column 15, lines 44-52 and Claims 15, 18 and 19); whereby accurate efficient control of said voltage applying causes uniform and reliable deposits of said biomolecules (Column 12, lines 13-29 and Claim 1) wherein the biomolecules are separated from said open ends of said capillaries as extremely marginal droplets and deposited onto said substrate (Column 15, lines 1-3) and wherein said plurality of capillaries are kept apart at all times i.e. the capillaries are positioned in array templates or sleeves that maintain the spatial arrangement and limit lateral movement of the individual capillaries (Column 15, lines 22-26). Additionally, Balch teach a PCR product is deposited onto the substrate (Column 35, lines 12-19 and Fig. 14) but they do not teach their apparatus comprises means for amplifying DNA in said capillaries by polymerase chain reaction. Haff et al. teach a similar apparatus for producing an array of biomolecules comprising a holder means for supporting a plurality of capillaries arranged in the same spacing interval as that of sites on the array (i.e. clamp bar, Fig. 20 # 234); means for adjusting a gap formed between said capillary holder and substrate (i.e. tube lift assembly, Fig 20, # 236); and means for transferring biomolecules from said capillaries to said substrate (i.e. plungers, Fig. 20 #266)

and further comprising means for amplifying DNA in said capillaries by PCR (Column 4, lines 19-35 and Fig. 20) wherein the capillary PCR simplifies the PCR reaction by reducing thermal gradient problems and shortens the PCR reaction time by providing for very rapid temperature changes (Column 5, lines 11-16 and 28-33). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the apparatus comprising capillary sleeve/array template through which the capillaries are spatially arrayed and controlled in the method of Balch (Column 12, lines 63-67) by incorporating a heat exchanging capillary sleeve/array template as taught by Haff et al. which also arrays and controls the capillaries but additionally provides the environment for amplifying DNA in the capillary by PCR to thereby provide and deposit PCR products rapidly and accurately as taught by Haff et al. (Column 5, lines 7-35) for the expected benefit of making continuous the amplification and deposition of the biomolecules into a single unified apparatus. The courts have stated that continuous operation of multiple process steps is obvious in view of the prior art teaching of the batch process (see *In re Dilnot*, 319 F.2d 188, 138 USPQ 248 (CCPA 1963 and MPEP, 2144.04 E.).

The claims recite numerous functional phrases and terms e.g. "said plurality of capillaries are kept apart at all times.....so that no current flows", "to prevent biomolecules from dropping down" and "to allow by force of attraction a very small volume of said biomolecules to move downward and swell out through said open ends at bottom of said capillaries".

However, the courts have stated that claims drawn to an apparatus must be distinguished from the prior art in terms of structure rather than function see *In re Danly*, 263 F.2d 844, 847, 120 USPQ 528, 531 (CCPA1959). "[A]pparatus claims cover what a device is, not what a device does." Hewlett-Packard Co. v. Bausch & Lomb Inc., 909 F.2d 1464, 1469, 15 USPQ2d 1525,1528 (Fed. Cir. 1990) (see MPEP, 2114).

The claims are drawn to an apparatus for producing biochips comprising the following structural components i.e. a plurality of capillaries having bottom open ends arranged at a same spacing interval as that of sites on a planar substrate dispose below said open ends of said capillaries, said open ends having a diameter which provide a surface tension greater than gravitational force; means for providing biomolecules; amplifying means for temperature processing; adjusting means for adjusting a gap formed between said open ends of said capillaries and said substrate; transfer means for transferring said biomolecules from said plurality of capillaries to said sites on said substrate, said transfer means comprising voltage means for applying voltage across said capillaries and said planar substrate; and stopping means.

As detailed above, Balch and Haff et al teach the claimed structural components of the apparatus. Because the courts have stated that an apparatus must be distinguished from the prior art in terms of structure and because Balch and Haff et al teach the claimed structures, the claimed apparatus is obvious in view of the teaching of Balch and Haff et al.

Response to Arguments

9. Applicant states that the instantly claimed method and apparatus overcomes problems in the prior art e.g. time consuming, expensive, inefficient and unreliable DNA replication. Applicant points to Fig. 10(b) for an illustration of the method and apparatus wherein biomolecules in the capillary are caused to swell out from the bottom ends and by force of attraction caused to be deposited onto the substrate. The statements regarding Fig.10(b) are noted. However, the figure illustrates an embodiment different from that instantly claimed. Fig. 10(b) is described on pages 6-7 of the specification. The embodiment of Fig. 10 includes a method and apparatus wherein a pin carrying a droplet of DNA is pressed onto a glass slide and voltage is applied to electrodes on opposite sides of the glass slide to extend the DNA molecule toward the positively charged electrode and allowed to dry. The embodiment illustrated in Fig. 10 does not utilize capillaries for deposit and does not cause biomolecules to

"swell out" from the "bottom ends" and does not deposit by "force of attraction". Instead, the instantly claimed method and apparatus are illustrated in Fig. 12 and described on pages 9-11.

Applicant further states that the instant method and apparatus do not need wetting electrodes or wetting surface as do Balch, Haff and Ohkawa. Applicant has not cited portions of Balch, Haff or Ohkawa to support this conclusion. In contrast to Applicant's conclusion, Ohkawa specifically teaches non-wetting electrodes (Column 7, lines 8-35). Additionally, wetting (or non-wetting) electrodes and surface are not limitations of the pending claims. Therefore, comments regarding wetting electrodes and surface do not address the claims and are therefore deemed moot.

Applicant further states that electrostatic attraction forces are engaged before the biomolecules contact the substrate and voltage is not needed after the biomolecules swell out of the capillaries. Applicant argues that Balch utilizes continued flow of probe solution is not applicable or relevant to the instant voltage application and substituting Ohkawa's teaching of voltage to move a droplet horizontally would not add anything to the method of Balch. The argument has been considered but is not found persuasive because as stated in the above rejection, Ohkawa specifically teaches that surface tension holding a droplet in a capillary (Column 3, lines 55-60) is overcome by applying voltage across the substrate and capillary (as illustrated in Fig. 4) so that the substrate and capillary are oppositely charged thereby allowing a very small volume droplet to move downward by force of attraction and to deposit onto the substrate (Column 7, lines 8-52) wherein the generation of these electrostatic forces deposit droplet without little if any loss of volume (Column 1, line 63-Column 2, line 1). Applicant asserts that Ohkawa only teaches horizontal movement of a droplet on a substrate. However, contrary to Applicant's assertion, Ohkawa specifically teaches depositing a droplet from a capillary down onto a substrate (Column 7, lines 8-35 and Fig. 4). Furthermore, it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to apply the electrostatic deposit of Ohkawa to the electrophoretic/electroosmotic deposit of Balch

and to generate an electrostatic force between the capillaries and substrate while keeping them apart to thereby deposit very small volumes of biomolecules without loss of volume as taught by Ohkawa for the obvious benefit of maintaining biomolecule droplet volume (Column 1, line 63-Column 2, line 1).

Applicant states that the instantly claimed "applying voltage" means voltage is used to oppositely charge the capillaries and biomolecules therein to cause electrostatic forces between the biomolecules and the substrate before the biomolecules contact the substrate, then the voltage is stopped and the droplets fall down by force of attraction thereby depositing biomolecules after PCR process in a controlled amount of very small volumes on fixed positions. Applicant argues that Balch deposits a probes solution for later PCR processing; Haff merely teaches PCR processing; and Ohkawa merely moves droplets between electrodes on the same plane and therefore none of the references teach the claimed invention or when combined provide a teaching which would make the instant invention obvious. The arguments have been considered but are not found persuasive because Balch does teach PCR product is deposited onto the substrate (Column 35, lines 12-19) as claimed; and because Ohkawa does teach depositing a droplet from a capillary down onto a substrate (Column 7, lines 8-35 and Fig. 4) as claimed. Therefore, Applicant's arguments regarding other teachings of the cited references are not relevant to the claims, or the instant rejection.

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, as stated above, it would have been obvious to one of ordinary skill in the art to apply the electrostatic deposit of Ohkawa to the electrophoretic/electroosmotic deposit of

Balch for the obvious benefit of controlling biomolecule droplet deposit in a small volume without loss of volume as taught by Ohkawa (Column 1, line 63-Column 2, line 1).

Applicant argues that Balch uses pressure to force probe solution out of the capillaries and there are no similar capillaries in Haff and Ohkawa from which the solution is exited. Thus, Applicant states, only Blach needs to be considered regarding the exiting of probe solution. The argument has been considered but is not found persuasive because as stated above Ohkawa clearly teaches deposit of a biomolecule solution down onto a substrate in a manner similar to that of Balch. Furthermore, Ohkawa supplements the teaching of Balch by describing the details of voltage application between the capillaries and substrate while Balch is silent regarding the details of voltage application. As such, it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to apply the voltage application as explicitly taught in Ohkawa to the voltage application of Balch for the obvious benefits of controlling biomolecule droplet deposit in a small volume without loss of volume as taught by Ohkawa (Column 1, line 63-Column 2, line 1).

Applicant states that in the instant invention, first, voltage is used to cause the droplet to break away from the open end, the voltage is then stopped and second the droplet falls by force of attraction to the substrate. Applicant argues that Balch teaches application of pressure and then instead of only a drop of very small amount, Balch uses continuous flow of probe solution. Applicant further argues that Balch does not teach specific means for using their electroosmotic/electrophoretic forces and Hall and Ohkawa have no teaching regarding the first and second part of depositing. The argument has been considered but is not found persuasive because the claims are drawn to "applying voltage.....biomolecules move downward....to be deposited concurrently on a plurality of site on said substrate.....; and stopping voltage...". As such, the voltage is stopped after the biomolecule is deposited, not before deposit as Applicant argues. Therefore, Applicant's arguments regarding the stopping voltage before deposit is not relevant to the instant claims. Additionally, the specification

describes the instantly claimed method wherein the voltage is stopped after the biomolecule is deposited i.e. "After deposition, electrification is stopped and the capillary holder is moved away from the substrate." (page 11, lines 5-12). Therefore, Applicant's arguments do not address limitations of the claim or embodiments described in the specification.

Applicant argues that the method and apparatus of Balch is for larger amounts of probe solution which is placed upon the reaction vessel and not a process for producing biochips. Applicant further argues that Ohkawa has no inkling of the problems related to the instant invention but merely teaches how to move a droplet horizontally and Haff only teaches means of PCR. Thus, Applicant argues, only Balch is relevant and Balch uses pressure, not voltage as a first deposit step. The arguments have been considered but are not found persuasive because the instant claim language "comprising" encompasses any additional method steps and/or apparatus components taught by Balch. The arguments regarding Ohkawa and horizontal movement have been thoroughly addressed above. Finally, the argument regarding the intended use for the method and apparatus of Balch is not found persuasive because, a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963). Balch clearly teaches deposit of small volumes onto the surface of a biochip as claimed (Column 14, line 66-Column 15,line 1) and they teach a process for producing a biochip as claimed (Abstract, lines 3-5).

Applicant again argues that Ohkawa only teaches horizontal movement of droplets from one electrode to another but does not teach movement from and through an open end then after leaving the open end to be deposited onto a substrate. The argument is not found

persuasive as detailed above i.e. Ohkawa clearly teaches deposit of a droplet down onto a substrate by first applying voltage and then dropping down to contact the surface as instantly claimed (Column 7, lines 8-35 and fig. 4).

Applicant acknowledges that Ohkawa deposits a droplet onto a substrate using voltage to move the droplet from the capillary. However, Applicant states that this embodiment has nothing to do with the instant invention which acts upon the droplet at the open ends to cause the droplets to swell out and exit the open ends. The argument has been considered but is not found persuasive because the claims are drawn to "apply voltage .....a very small volume of said biomolecules to move downward and swell out through said bottom ends". As such, the claims are not limited to a voltage which acts upon a droplet at the open ends as argued. Therefore, the argument is not relevant to the instant claims. Additionally, Ohkawa applies voltage across the capillary and the substrate causing an electrostatic force between the biomolecules and substrate as claimed. While Ohkawa does not use the phrase "swell out", Fig. 4 is a schematic illustration of the method and apparatus of Ohkawa. The figure does not illustrate the shape of the droplet as it exits the end of the capillary. However, the droplet would change shape upon exiting the end of the capillary because upon exiting the end of the capillary, the droplet would no longer be physically constrained by the capillary walls. As such, the sides of the droplet previously constrained by the capillary walls would swell out due to the absence of constraint. Because the droplet of Ohkawa would change shape upon exiting the capillary, one of ordinary skill in the art would assume the droplet swells out as it exits the end of the capillary.

It is noted that In re Best (195 USPQ 430) and In re Fitzgerald (205 USPQ 594) discuss the support of rejections wherein the prior art discloses subject matter in which there is reason to believe inherently includes functions that are newly cited or is identical to a product instantly claimed. In such a situation the burden is shifted to the applicants to "prove that

subject matter shown to be in the prior art does not possess characteristic relied on" (205 USPQ 594, second column, first full paragraph).

Double Patenting

10. In response to the previous rejection under the judicially created doctrine of obviousness-type double patenting over claims 21-22 of copending Application No. 09/792,967, Applicant has abandoned the '967 application. The previous rejection under over double patenting is withdrawn in view of the abandonment of the '967 application.

Conclusion

11. No claim is allowed.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to BJ Forman whose telephone number is (703) 306-5878. The examiner can normally be reached on 6:30 TO 4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Jones can be reached on (703) 308-1152. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-4242 for regular communications and (703) 308-8724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0196.

BJ Forman, Ph.D.
Patent Examiner
Art Unit: 1634
January 17, 2003